

**BEFORE
THE PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA
DOCKET NO. 2019-393-E**

IN RE: Application of Dominion Energy South)	
Carolina, Incorporated for Approval of)	DIRECT TESTIMONY
"Storage Tariff" (Technology-Neutral)	OF RONALD DIFELICE
Avoided Cost Rates for Energy and)	ON BEHALF OF SOUTH CAROLINA
Capacity for Dispatchable Renewable)	SOLAR BUSINESS ALLIANCE, INC.
Generating Facilities))	
)	
)	

I. INTRODUCTION AND PURPOSE OF TESTIMONY

Q. Please state your name and business address.

A. My name is Ronald DiFelice, and my business address is 101 N. Columbia St, Ste 200, Chapel Hill, NC 27514.

Q. Please provide your educational background.

A. I have a Bachelor of Science degree in Chemistry from the Rochester Institute of Technology, a Master of Science degree in Chemistry from the Rochester Institute of Technology, a Ph.D. in Chemistry from Virginia Tech (with honors, Phi Lambda Upsilon), and a Master of Business Administration from the University of North Carolina at Chapel Hill's Kenan-Flagler Business School (with honors, Beta Gamma Sigma).

Q. Please describe your work and professional experience.

A. I have been focused on the energy storage industry since 2001. I currently serve as an Energy Storage Project Developer, Consultant, and Managing Partner at Energy Intelligence Partners, LLC, where I lead the company's energy storage practice and utility-scale energy storage development projects. My work also supports our clients' policy initiatives and regulatory engagements with various state legislatures. Prior to co-founding Energy Intelligence Partners in 2014, I was the founder and CEO of Alpha V, Inc., a company that, over eleven years, commercialized innovative energy solutions spanning energy storage, power generation, renewable energy systems, and power transmission. I was also previously Vice President & Owner at MediPak Energy Systems, where over five years I led the technical team that brought premium rechargeable lithium ion battery

products from design to deployment for Department of Defense customers. I currently serve on the Board of Directors for the North Carolina Sustainable Energy Association.

Q. Have you previously appeared in a proceeding before the South Carolina Public Service Commission?

A. Yes. I presented before this Commission in an Allowable Ex Parte Communication Briefing held on October 23, 2018. The presentation was entitled “Avoided Cost, Resource Planning and Energy Storage in an Era of Low-Cost Solar.”

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to respond on behalf of the South Carolina Solar Business Alliance, Inc. (“SBA”) to the Dominion Energy South Carolina, Inc. (DESC) “Rate PR – Qualifying Facility Storage for Battery Storage that Meets the Requirements for a Qualifying Facility Under the PURPA And S.C. ACT NO. 62 OF 2019” DOCKET NO. 2019-393-E (the “Storage Tariff”).

Q. How is your testimony organized?

A. My testimony is organized as follows:

II. Overview and commercial reasonableness of the Storage Tariff as proposed by DESC.

III. Specific comments and recommended changes to improve the Storage Tariff, with justifications.

IV. PURPA and Act 62 compliance.

1 **Q. Are you sponsoring any exhibits to your testimony?**

2 **A.** Yes. Exhibit SBA/RF-1 is a redlined version of the Storage Tariff reflecting all of the
3 modifications that I believe are necessary and appropriate.

4 **II. OVERVIEW AND COMMERCIAL REASONABLENESS OF THE STORAGE**
5 **TARIFF AS PROPOSED BY DESC**

6 **Q. Describe your understanding of the purpose of the Storage Tariff.**

7 **A.** The Storage Tariff is intended to satisfy DESC's obligation to file a tariff that "provide[s]
8 accurate pricing for storage as a separate resource" pursuant to a settlement agreement
9 entered into by Dominion Energy, South Carolina Electric & Gas and the South Carolina
10 Solar Business Alliance and approved by this Commission in Order No. 2018-804 (the
11 "Settlement Agreement").

12 **Q. Does the Storage Tariff satisfy the purpose?**

13 **A.** The Storage Tariff generally satisfies the purpose as proposed by DESC, but there are
14 several elements that need to be modified for the Storage Tariff to be workable and
15 commercially reasonable. It would not be consistent with the intent of the Settlement
16 Agreement for DESC to put in place a tariff that, as a practical matter, would not be used
17 by a Storage Qualifying Facility ("QF"). My experience negotiating energy storage Power
18 Purchase Agreements (PPAs) and developing large-scale energy storage projects with
19 other utilities informs my view of commercially reasonable terms and the modifications
20 suggested here.

III. SPECIFIC COMMENTS AND RECOMMENDED CHANGES TO IMPROVE THE STORAGE TARIFF, WITH JUSTIFICATIONS.

Q. Please describe the modifications that you believe are necessary to the Storage Tariff as proposed by DESC.

A. The first issue is clarifying that the Storage Tariff is available both to solar facilities with an integrated battery storage unit and to separate storage facilities that are charged by a solar generator. Consistent with the intent of the Settlement Agreement, which specifically called for a tariff for “storage as a separate resource,” DESC has informed SBA that it intends for the tariff to be available to solar facilities with an integrated battery storage unit. My edits to the first paragraph of the Storage Tariff, and conforming changes throughout the document, are intended to accomplish this objective.

Q. What is your next concern about the Storage Tariff?

A. I have concerns about method for calculating the total interconnection service capacity and capability of the Storage QF, whether a combined solar + storage facility or distinct solar and storage facilities.

Q. What is your opinion about how DESC should determine the total interconnection service capacity and capability of the Storage QF?

A. For purposes of calculating the generating capacity of the Storage QF, the interconnection service capacity studied by DESC should be the interconnection service capacity applied for at the point of interconnection, rather than the aggregate nameplate capacity of the generator and the battery storage unit.

Q. Is there precedent for determining the interconnection capacity in this manner?

A. Yes. This would align the DESC Storage Tariff with the Federal Energy Regulatory Commission (“FERC”) Final Rule to amend the pro forma Large Generator Interconnection Procedures (“LGIP”) and Large Generator Interconnection Agreement (“LGIA”) (“Order No. 845”) issued on April 19, 2018. The FERC’s objectives for issuing the order were to improve system reliability, promote more informed interconnections, and to remove inefficiencies in generators’ interconnection processes. Order No. 845 allows an interconnection customer to request interconnection service at a level lower than the nameplate generating facility capacity. This addresses the inefficiencies that result from a generating facility (with or without an energy storage component) having to comply with transmission upgrade requirements for capacity that the generating facility will never use and does not need. Order 845 recognizes the existence of proper control technologies to limit facility output and allows for penalties to be levied if a generating facility does inject energy above the level of requested service. It is also an acknowledgement that facilities that implement DC-coupled energy storage are physically incapable of injecting more power than the nameplate capacity of the Generating QF.

Q. Have you addressed this issue in Exhibit SBA/RF-1?

A. Yes. The new third paragraph that I have inserted into the Storage Tariff addresses this issue.

Q. Do you believe that the Storage Tariff should be limited to new facilities and not available to existing solar facilities that seek to add a battery storage unit?

1 A. No, I can see no commercially reasonable or policy grounds for such a limitation. In
2 addition, given the uncertainty about the extent and timing of the development of new solar
3 resources in DESC's service territory, such a limitation could delay and limit the benefits
4 of storage additions to DESC ratepayers. It is also not consistent with the Settlement
5 Agreement.

6 Q. **Have you addressed this issue in Exhibit SBA/RF-1?**

7 A. Yes, I have addressed this issue by deleting what was originally the third paragraph of the
8 Storage Tariff.

9 Q. **Do you believe that modifications are needed to the "Character of Service" section of**
10 **the Storage Tariff?**

11 A. Yes. In addition to the clarifying and conforming edits I have made in Exhibit SBA/RF-1,
12 I have addressed the following substantive issues: (i) allowing the Storage QF facility to
13 consume energy from the Storage QF and Generating QF for auxiliary loads; (ii) control
14 of the Storage QF; (iii) output capacity requirements, and (iv) charge and discharge
15 requirements. Note that DESC used PROSYM software to model the electric system and
16 study the difference in operating costs with and without the storage resources, but they did
17 not provide a study or details on the inputs and methodology for their energy shifting
18 analysis with fast-responding battery energy storage as contemplated in the Storage Tariff.
19 Therefore, commentary on the specific payment values proposed for Storage QF Capacity
20 Rate and the Storage QF Energy-Shifting Rate are beyond the scope of my testimony.

21 Q. **What modifications are needed to CHARACTER OF SERVICE 3 and why?**

1 **A.** The Storage Tariff currently would prohibit the Storage QF from providing “all or any
2 portion of its capacity for sale or consumption by anyone, including the Generating QF,
3 other than the Company.” Battery storage units and renewable energy generators require
4 power for HVAC systems, monitoring and control equipment, power conversion, and
5 communication systems, among others, even while in standby mode (“Auxiliary Loads”).
6 For some energy storage designs and applications, power consumed by Auxiliary Loads is
7 most efficiently provided by the energy storage system itself (indirectly from the
8 Generating QF), rather than from the electricity grid. Having the option to power Auxiliary
9 Loads from either source is important for implementing the most efficient and cost-
10 effective design, and it is standard practice to address this in individual PPAs.

11 **Q.** **Have you modified CHARACTER OF SERVICE 3 in Exhibit SBA/RF-1 to address**
12 **this concern?**

13 **A:** Yes. As revised, it would read as follows: “3. The battery storage unit may not provide all
14 or any portion of its capacity for sale or consumption by anyone, except for the renewable
15 energy generator or the battery storage unit, other than the Company;”.

16 **Q.** **What modifications are needed to CHARACTER OF SERVICE 4 and why?**

17 **A.** The Storage Tariff currently would require the Storage QF to “[i]mplement and maintain
18 communication equipment that will allow the Company to control the operation.” The
19 Financial Accounting Standards Board issued ASU 2016-02, its final standard on leases,
20 on February 25, 2016 with an effective date for calendar periods beginning January 1, 2020,
21 for all entities. A full description of this standard is beyond the scope of this testimony, but
22 it represents a significant change to lease accounting and whether an off-take arrangement

1 like a PPA is a lease. Whether the Lessee or Lessor has control effects the accounting
2 treatment of off-balance-sheet operating leases and has significant project finance
3 implications for the Company (Lessee) and the project owner (Lessor). It is advantageous
4 for all parties to ensure the project owner (Lessor) maintains direct control of the asset,
5 which does not preclude receiving operating instructions from the Company (Lessor) to
6 operate in a manner desired by the Company. In addition, if the tariff is applicable to
7 combined solar + storage facilities, DESC's operational control specifications should be
8 limited to the battery storage unit.

9 **Q. Have you modified CHARACTER OF SERVICE 4 in Exhibit SBA/RF-1 to address**
10 **this concern?**

11 **A.** Yes. As revised, it would read as follows: "4. The Storage QF must implement and maintain
12 communication equipment that will allow for operation (e.g., charges and discharges) of
13 the battery storage unit in compliance with the Company's specifications;"

14 **Q. What modifications are needed under CHARACTER OF SERVICE 5 and why?**

15 **A.** The Storage Tariff currently requires the Storage QF to "[h]ave the ability to maintain its
16 nameplate discharge capacity and, when fully charged, to deliver its nameplate discharge
17 capacity for at least four (4) consecutive hours less any degradation agreed upon in the
18 PPA where such degradation rate is consistent with industry standards". The "nameplate
19 discharge capacity" is not the appropriate metric here and instead the metric should be the
20 "contracted discharge capacity" as specified by the project owner and agreed to in the PPA.
21 This is consistent with the FERC Order 845 as previously discussed and accommodates
22 the fact that actual nameplate capacity depends upon differing capacity "blocks" of AC

inverter capacity offered by inverter manufacturers. For example, a project contracted for 12.0 MW of capacity may have a nameplate inverter total of 12.7 MW to achieve 12.0 MW because of the more economic blocks of inverter capacity offered. Furthermore, the requirement for the battery energy storage to provide discharge capacity for at least four (4) hours should be justified by DESC given that the recent Commission Order in the DESC avoided cost proceeding (Order No. 2019-847) concluded that DESC has a three (3) hour capacity need from 6am – 9am during the months of December, January, and February. A 4-hour requirement vs. a 3-hour requirement makes the project economics more burdensome for project developers and may not provide additional value to DESC. Allowing a Storage QF the option to provide three or four hours should be allowable and solidified in the project PPA.

Q. Have you modified CHARACTER OF SERVICE 5 in Exhibit SBA/RF-1 to address this?

A. Yes. As revised, it would read as follows: “5. The battery storage unit must have the ability to maintain its contracted discharge capacity and, when fully charged, to deliver its contracted discharge capacity in increments of either three (3) or four (4) consecutive hours less any degradation agreed upon in the PPA where such degradation rate is consistent with industry standards;”.

Q. What modifications are needed to CHARACTER OF SERVICE 6 and why?

A. The Storage Tariff currently requires that the battery storage unit must be capable of 365 charge and discharge cycles in each calendar year over the term of the PPA. While this may be technically feasible for the battery storage unit, this requirement would be

commercially unreasonable and impossible to accomplish while maintaining the Storage QF's ability to capture the full solar Investment Tax Credit (ITC), which requires the battery storage unit receive 100% of its charging energy from the solar Generating QF to capture 100% of the ITC. Language reflecting a more commercially reasonable and practical guarantee of performance is required.

Q. Have you modified CHARACTER OF SERVICE 6 in Exhibit SBA/RF-1 to address this concern?

A. Yes. As revised, the battery storage unit is subject to a "90% performance guarantee, such that 90% of the called hours by the Company must be met by the battery storage unit over the course of a year."

Q. Do you believe that modifications are needed to the MONTHLY RATES FOR GENERATION WITH STORAGE PPA CONTRACTS ONLY section of the tariff and why?

A. Yes. I believe that the Storage Tariff needs to acknowledge that DESC will update the rates for the tariff if and when it enters into PPAs with 100 MW of Storage QFs at the rates contained in the Storage Tariff. In Exhibit SBA/RF-1 I have modified the last paragraph of subsection ii. of this section accordingly.

Q. Do you believe that modifications are needed to the LIMITING PROVISIONS section of the Storage Tariff and why?

A. Yes. The Limiting Provisions section of the Storage Tariff states that "Power discharged from the Storage QF may not be used to satisfy contractual requirements of the Generating QF." This may disallow using the Storage QF to smooth the variability of the generator to

the benefit of the Company. Energy storage can reduce the variability of generation simultaneous with, and in addition to, energy shifting, and it should be allowed to do so if it allows the generator to avoid DESC's Variable Integration Charge, since there would be no additional system costs to integrating the solar generation resource.

Q. Have you modified the LIMITING PROVISIONS section of the Storage Tariff to address this concern?

A. Yes. I recommend deleting the second paragraph of this section.

Q. Are there other modifications to the tariff that SCSBA believes would be appropriate?

A. Yes. Exhibit SBA/RF-1 contains a variety of editorial changes throughout the Storage Tariff that I believe improve its clarity, structure and internal consistency, or that are confirming to the other modifications that I am recommending.

IV. PURPA AND ACT 62 COMPLIANCE

Q. Does the proposed Storage Tariff fully satisfy DESC's obligations under PURPA and Act 62?

A. No. There are several additional issues that remain to be addressed. First, DESC needs to develop and obtain Commission approval of an operating protocol for battery storage units that are incorporated into QFs. The Operating Protocol included as Exhibit 10 to Duke Energy's Large QF PPAs recently approved by the Commission provides a good model for such a protocol, although I do not think it is necessary or appropriate to limit storage additions to QFs to those that are DC-coupled. Second, where a battery storage unit is

1 added to a QF with an existing PPA, DESC needs to establish and obtain Commission
2 approval of a methodology for pricing the increased or modified output from the QF. Third,
3 DESC, with the Commission's approval, needs to establish how QFs proceeding under the
4 Storage Tariff or adding storage under a PURPA PPA will be prioritized for purchase price
5 enhancements resulting from storage. And finally, the Commission's interconnection
6 procedures need to be modified to facilitate storage additions to QFs, perhaps in a manner
7 like the procedures recently approved by the North Carolina Utilities Commission.¹

8 **Q. Does this conclude your testimony?**

9 **A.** Yes.

¹ North Carolina Utilities Commission, Docket No. E-100 Sub 101, *Order Approving Revised Interconnection Standard and Requiring Reports and Testimony* (June 14, 2019).